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OCT 0 7 2005
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In the United States Patent and Trademark Office

Mailed: ALVISO, CA 10-4-2005
At: ____________

Re: Vehicle Operation Display System;
File number 10/684,031

Mail Stop: Patent Application

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the communication of the USPTO First Office Action dated 7/25/05 for the subject patent application, applicant replies as follows:

1. Claims 1-54, 66-74 are original claims and are subject to this response to the Office Action. Claims 55-65 were canceled in the amendment dated June 13, 2005. Claims 1-54 are hereby canceled. Claims 66-74 have had the noted informalities corrected. Claims 67, 68 are amended as set out below. New claims 75-109 are hereby added as set out below.

2. A corrected version of "The Field of Invention" and amended versions of "Background of the Invention", "Summary of the Invention", "Brief Description of the Drawings" and "The Specification", 23 pages, are attached hereto and replace, in total, the prior versions.

3. For the convenience of the Examiner, the comments immediately below are made with reference to the previous specification by page and line number(s).

(1) References at page 14, line 7 and page 15, line 4 regarding a "variable shape 77" have been eliminated from the new specification.

(2) Reference numbers 63 and 82 have been eliminated from the new specification.

(3) In reference to item 3(ii) of the Office Action, reference number 19 is first referenced as a "harmonic frequency sensor 19" at page 13, lines 10-13 and consistently thereafter on

page 16, line 25 and on page 17, line 1, and not as a "wheel torque sensor" or "center of gravity sensor" as asserted by the Examiner. The word "flux" is inserted before the word sensor, page 17, line 4 since the description of this sensor as a flux sensor 35 is appropriate as it senses flux in both an electromagnetic clutch 24 and in an ABS controller 48. It should be understood that an ABS controller 48 can be a stand alone unit or can be mounted on the master brake cylinder 48.

The relevant phrase in the old specification at page 17, lines 19-22 therefore is modified to read "..., a flux sensor 35 on the ABS controller 48 alone or on the master brake cylinder 28,...". Figure 11B schematically shows the two items 28, 48 as one unit. Should it be deemed that the term "alone or" adds new material, the term can be omitted however it is asserted by the applicant that the original wording of "and/or" discloses usage on a stand alone ABS controller 48 only. (these changes are underlined in the new specification at page 18, lines 14, 15 and are the only amendments to the specification).

(4) In reference to item 3(iii) of the Office Action, please refer to page 7, lines 19-22, wherein the previous specification states "...Alternately, said display device 30 is a hand held computer, also called a PDA ..." and to Figure 11B which schematically shows a mounted display 30 linked from a display system CPU 36 with input from a flux sensor 35. The PDA typically is mounted within the vehicle on or near the dash. The term "mounted" refers to a new component which was not original equipment and which is mounted on or within a vehicle.

It is therefore asserted by the applicant that no amendment to claims 71 and 74 is required as the reference to said PDA in each claim is proper.

In conclusion therefore, it is asserted by the applicant that no new or corrected drawings are required.

4. Claim 67 is amended to eliminate "on or at said at least one clutch."

5. Claim 68 is amended to eliminate "to said at least one clutch."

6. The prior art made of record, four patents, and cited by the applicant and the seven patents cited in the Office Action, are commented upon herein below as follows:

Regarding Dunwoody et al, US Pat No 5,825,284, the disclosure is of a system and method relating to the approach of a rollover condition of a vehicle. It makes no mention of and no claims are made regarding the display of information regarding the torque delivered to the wheels, the amount of the braking forces at the wheels, the steering angle of the front wheels or the power consumption of vehicle components. Regarding these specific items, the Dunwoody patent is completely silent. Therefore for the presentation of such information, which is disclosed by the present invention, the Dunwoody patent is remote and is not instructive.

Comment however is required as regards the detection of the approach of a rollover condition of a vehicle as disclosed by the Dunwoody patent. In this regard, the Dunwoody patent is defective. The Dunwoody patent discloses the need to determine the "lateral acceleration and the lateral load transfer" and to calculate an "actual roll moment" using tilt sensors. In this regard, the Dunwoody specification states as follows:

"In a preferred embodiment, roll moment calculator and center of gravity calculator are portions of a single processor. The processor calculates a lateral load transfer ratio indicative of an actual roll moment compared to a maximum roll moment, with the display indicating the lateral load transfer ratio. In one embodiment, the sensor assembly includes three independent sensor units. The first sensor unit is mounted to the frame to generate signals indicative of lateral acceleration of the vehicle body. The second and third sensor units are oriented to generate signals indicative of lateral load transfer in the suspension system. The second and third sensor units may be mounted on opposing sides of the vehicle axle to generate signals indicative of load transfer from one side of the vehicle axle to the opposing side of the vehicle axle. The second and third sensor units may be processed to generate a differential signal used to determine the lateral load transfer. In an alternative embodiment, the sensor assembly comprises two sensor units. The first sensor unit is coupled to the frame to detect lateral acceleration while the second sensor unit is mounted on the vehicle axle. The first and second sensor units are used to detect load transfer from one side of the vehicle axle to the opposing side of the vehicle axle."

The methods described by the Dunwoody patent to determine the true center of gravity of a vehicle are inoperable. The measurement means described to determine "a lateral load transfer" by the Dunwoody patent is by measuring a lateral weight shift of a vehicle. This type of measurement is directly affected by irregularities in the roadway which can cause a expansive or contractive force in an axle or lateral shifts in the vehicle. More importantly however, the lateral weight shifts of a vehicle are not directly related to its center of gravity. Restated, a heavy low load can give the same sensed result, a lateral weight shift, as a higher lighter load even though the centers of gravity are different. The lateral acceleration sensor does not provide center of gravity information. Although the Dunwoody patent claims to be able to calculate the true center of gravity of a vehicle, the means disclosed fail to achieve this objective.

The present invention utilizes a harmonic frequency analyzer 19 to analyze the frequency of the principal lateral resonance mode. Regardless of the weight distribution within a vehicle, it provides the information needed to calculate the true center of gravity as the principal vibration modes of the vehicle are always centered on the center of gravity of the vehicle. Changes in the frequency sensed therefore are directly related to vertical shifts in the center of gravity. The front-to-rear oscillations are not needed and are not measured. This center of gravity information and the data from the lateral acceleration sensor 37 allow the calculation of the true orientation of the weight vector toward the line between the bottoms of the two wheels on one side of the vehicle from the center of gravity. This vector, as calculated and as displayed, is a very accurate and precise indication of the approach of a rollover condition for a vehicle. As regards the detection and calculation of the approach of a rollover condition of a vehicle, the method used by the present invention is very different from that described by the Dunwoody patent. In this regard the present invention is a fully operable, accurate and new apparatus, system and method.

The Dunwoody patent does not disclose a method of accurately determining the center of gravity of a vehicle or the true turning moment. Therefore it teaches away from the present invention and teaches an inoperable technology.

Regarding Hoffman et al, US Pat No 5,949,330, the disclosure is of an apparatus and method for a general monitoring and diagnosing means. The means disclosed are for any type of system which can be monitored and no mention is made of any application involving a motor vehicle. It recites the use of a flashing signal when switching from a graphical representation to a numerical presentation. The Hoffman patent does not recite the specific operating parameters which are to be monitored nor any specific type of graphical presentation. The scope of use of the disclosed apparatus and method is broad, however its vagueness and lack of specificity should not be a general bar to other, novel applications which disclose dedicated applications involving displays. The Hoffman patent does not disclose a display which indicates the approach of a rollover condition of a vehicle or of the distribution of torque to the wheels of a vehicle or of the braking forces at the wheels of a vehicle. Therefore it is remote from the present invention. It does not teach or disclose the present invention which is a new combination.

Regarding Hauler, et al, US Pat No 6,721,634, the disclosure is of methods of utilizing a "freely programmable instrument cluster" within a vehicle whose various types of displays are selectable by the driver. These displays are not dedicated displays as with the present invention. No disclosure is made of displays which present information regarding the approach of a rollover condition for a vehicle, the braking forces at the wheels or the torque delivered to the wheels. The disclosed "freely programmable instrument cluster" is intended to provide the driver with a variety of options for the review of operational parameters. The Hoffman patent thus does not disclose or teach the present invention.

Regarding Opel, US Pat No 5,555,502, the disclosure is of a control system and an associated method to regulate the performance of a vehicle by using a display and control input means to modify the performance of the vehicle. An active input decision and action by the driver is required by the disclosed system and associated method. The actions of the driver modify the operating parameters of the vehicle in response to the parameters displayed. This dynamic input and control required of the driver to modify the operating parameters of a vehicle is a specialized control system unrelated to the present invention. A general type of display is disclosed with no disclosure of the display of information relating to the distribution of torque to the wheels, braking forces or the approach of a rollover condition for the vehicle. Further even if this type of information would be displayed, it would be of no value to a driver having a system as described by the Opel patent as such information could not be used to modify the operating parameters of a vehicle. Restated, the distribution of torque to the wheels for the present invention is not under the control of the driver but is an automatic response of the control system of the vehicle. At best, the presentation of this information is purely a passive presentation from which no action modifying the vehicle's operating parameters by a driver is possible. Such information however can be used by the driver to modify the manner in which the vehicle is driven and this aspect of control is at the core of the present invention. It is absent from the concepts disclosed by the Opel patent. The Opel patent therefore is remote from and does not teach the present invention.

Regarding Jabei, et al, US Pat No 5,880,710, the disclosure is of a device and a method relating to the display of vehicle operating parameters. The method recited involves a general selection and display means. A classification scheme is disclosed which selects among various out-of-range parameters for their display to the driver. The approach utilized involves the filtering of information obtained from various components prior to displaying the information to the driver. The Jabei patent discloses a device and method of providing "a first display having a plurality of selectively energizable segments arranged in a preselected pattern" which requires a selective process either by a processing means and/or by the driver. No disclosure is made of any process of or means for the presentation of the approach of a rollover condition of a vehicle or of the distribution of torque to the wheels. The device and method disclosed are not dedicated display means and utilize a filtering process whose logic determines what is to be presented. This is remote from and does not teach the present invention.

Regarding Haubner, et al, US Pat No 4,594,572, the disclosure is of a complex display means having multiple presentations and is primarily concerned with the manner of processing the information. Although the status of a wide variety of dynamic conditions regarding a vehicle can be presented, the examples given are of currently available presentations such as the amount of fuel in the fuel tank. Further, the presentations are lumped into a series of blocks and are not independent dedicated displays. No disclosure is made regarding the display of information regarding the approach of a rollover condition of a vehicle or of the torque delivered to the wheels. The vague, general claims and, except for a fuel gauge, the lack of specificity as to operating parameters in the specification provides no insight as to the types of information to be collected and displayed. The Haubner patent does not disclose or teach the method, the device or the system of the present invention.

Regarding Berkert, et al, US Pa No 5,949,345, the disclosure indicates that application software programs and their related screens are to be utilized and that selection among the options provided by these are to be made by the driver while the vehicle is being driven. The system disclosed by the Berkert patent utilizes a standard computer oriented selection method for access to the display information. It is not a dedicated system which always presents specific types of information at all times as is done with the present invention. No disclosure is made by the Berkert patent of the display of information regarding the approach of a rollover condition of a vehicle or of the torque delivered to the wheels. The apparatus, method and system disclosed by the present invention is a dedicated presentation of specific types of information which is not taught by the Berkert patent.

Regarding Sumada, et al, US Pat No 6,603,393, the disclosure is of a display system of "high-priority and high-emergency information", the sole example given being that of an open trunk compartment of a car. The disclosure is an attempt to broadly encompass all displays of any type of information which may be of use to a driver of a vehicle or a motorcycle while only enumerating one example. The Sumada patent does not disclose or teach the presentation of information regarding the approach of a rollover condition of a vehicle or of torque distribution to the wheels. The vagueness of the disclosure and the lack of specificity as to the parameters to be monitored and as to the manner of displaying the information, should properly limit the scope of the Sumada patent to the specific application described therein. The Sumada patent is remote from the apparatus, system and method of the present invention.

Regarding Iida, et al, US Pat No 6,497,301, the disclosure is of a variable torque distribution system and does not disclose a means of monitoring a system or of displaying the dynamic condition of vehicle parameters to the driver. The Iida patent is not relevant to a display means as disclosed by the present invention.

Regarding Nishida, et al, US Pat No 6,493,623, the disclosure is of a dedicated transfer means for power transfer for a four wheel drive vehicle and does not disclose a means of monitoring a system or of monitoring the status of a system and of displaying the dynamic condition of the vehicle's components to the driver. The Nishida patent is not relevant to a monitoring and display system, method or apparatus as disclosed by the present invention.

Regarding Brown, et al, US Pat No 6,398,688, the disclosure is of an special clutch system for the transfer of power and does not disclose a means of monitoring or displaying the